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## Foot Massage as an Alternative to Improve Sleep Quality of Elderly Patients



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### Article Information

### Abstract

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A high proportion of elderly in Indonesia experienced poor sleep quality. The psychological impact of poor sleep quality is decreased cognitive function, decreased immunological function, and negative and more emotional changes in thoughts. Foot massage can induce deep relaxation, alleviate anxiety and pain, and enhance sleep quality. This research aimed to determine the impact of foot massage on the sleep quality of elderly patients. This was quantitative research, a type of pre-experimental research. The design used a group pre-test and post-test design. The number of respondents was 20 elderly patients with a *composmentis* who were treated in the inpatient ward of the Budi Rahayu Catholic Hospital and were taken using purposive sampling—data collection using PSQI questionnaires before and after foot massage. The research indicated that the average sleep quality score was 8.4 before the foot massage, and decreased to 4.85 after the massage. The Wilcoxon signed ranked massage test results obtained a p-value of 0.000. It can be concluded that there is a notable difference in sleep quality score before and after foot massage in elderly patients. Nurses are encourage to utilize foot massage as an independent intervention to enhance the sleep quality of elderly patients. Nurses can educate the patient's family on foot massage techniques to enhance the quality of the patient's sleep and help speed up the healing process.

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## INTRODUCTION

Aging is a life cycle that every human being cannot avoid. As the elderly age, it causes various health problems such as an increase in degenerative diseases, cancer, and decreased productivity of the elderly. Reduced productivity in the elderly occurs due to physiological decline, which can lead to a reduction in their sleep quality. ([Sumedi et al., 2019](#)). Poor sleep quality in the elderly cannot be considered a simple disorder, because it generally cannot heal spontaneously. This condition also causes various bad impacts, including stress, mood disorders, and substance abuse, which will eventually lead to a decrease in quality of life ([Merlianti, 2014](#)).

Over nearly five decades, the elderly population in Indonesia nearly doubled, reaching 9.6% (25 million) in 2019. The number of elderly residents in East Java is 12.96% ([BPS, 2019](#)). Data on elderly people in the city of Blitar is 13.44% ([BPS, 2020](#)). Data on the prevalence of poor sleep quality in the elderly globally is 69% -76% (Sleep Foundation, 2020). The prevalence of poor sleep quality experienced by the elderly in Indonesia is 67%, and in East Java, it is 45% ([Alvis et al., 2020](#)). A preliminary study conducted in July 2023 involved 20 elderly patients with a complemented level of consciousness who were treated in the inpatient ward of the Budi Rahayu Catholic Hospital. Through interviews, data was obtained that 13 elderly patients experienced poor sleep quality with an increase in the number of hours of sleep. They frequently wake up during the night and struggle to fall back asleep.

Sleep is a vital aspect of health and well-being throughout all stage of life ([Miner & Kryger, 2017](#)). The consensus of the National Sleep Foundation in the United States recommended a level of sleep duration for older adults of 7-8 hours ([Hirshkowitz et al., 2015](#)). Poor sleep quality in the elderly is caused by lifestyle patterns such as heavy drinking, drinking coffee, smoking, and sporadic work hours), mental factors (mental disorders), actual illnesses (asthma, sinusitis, and influenza), and mental factors (prolonged stress). ), as well as

environmental factors (train tracks, processing plants, living environment, and deafening television sound) ([Ainun et al., 2021](#)). Sleep complaints have important consequences in older adults. The impact of poor sleep quality can be divided into psychological and physiological. The physiological effects of poor sleep quality are excessive sleepiness during the day, decreased personal health, fatigue, increased heart rate and blood pressure, and increased appetite and glucose levels. Meanwhile, the psychological impact of poor sleep quality is decreased cognitive function, decreased immunological function, and negative and more emotional changes in thoughts ([Kholifah, 2016](#)).

Therapies that can enhance sleep quality include both pharmacological and non-pharmacological approaches. Pharmacological therapy involves the use of sleeping pills; however, long-term use may interfere with sleep and lead to more severe issues, such as drug dependence, reduced metabolism in the elderly, impaired kidney function, and cognitive decline. ([Widiana et al., 2020](#)). Meanwhile, non-pharmacological therapy has the advantage of not causing side effects and is relatively easy to use. Some types of non-pharmacological therapy are relaxation, music, massage, foot massage, yoga, progressive relaxation, meditation, and aroma therapy ([Widiana et al., 2020](#)).

Foot massage can offer deep relaxation, alleviate anxiety, lessen pain and physical discomfort, and enhance sleep quality ([Afianti & Mardhiyah, 2017](#)). Foot massage can provide comfort for patients; apart from that, it also has low-cost considerations, can be done independently, and is an easy procedure. Foot massage helps improve circulation, eliminate metabolic waste, enhance joint mobility, reduce pain, relax muscles, and promote a feeling of comfort for the patient ([Afianti & Mardhiyah, 2017](#)). There was no research has been conducted on the impact of foot massage on the sleep quality of elderly patient at RSK Budi Rahayu, Blitar City. So researchers are interested in conducting this research.

**METHOD**

This was a pre-experimental study with one group pre-test post-test design which aimed to determine how foot massages affected the elderly patients' at Budi Rahayu Catholic Hospital, in Blitar City. The study's dependent variable was sleep quality of elderly patients. While foot massage served as the independent variable. The population in this research were elderly patients who were treated in the inpatient room at Budi Rahayu Catholic Hospital, Blitar City. In this study, purposive sampling with inclusion criteria was the sampling method. They are: 1) Patients who have poor sleep quality as assessed using the PSQI questionnaire (PSQI score >5), 2) Patients who are cooperative, communicative, and can make eye contact, 3) Patients who did not experience fractures, trauma or injuries to the legs so that it was

not possible to carry out research. Meanwhile, the exclusion criteria were 1) patients who experienced decreased consciousness before the research was completed, 2) patients who went home or were referred before the research was completed, and 3) patients who took sleeping pills. The Pittsburg Sleep Quality Index (PSQI) questionnaire served as the research tool to assess the sleep quality of the elderly and foot massage SOP (Standard Operating Procedures). Selected respondents will be given a foot massage for 15-20 minutes twice a day for two days. Then respondents will be assessed for their sleep quality. The collected data will be analyzed using the Wilcoxon Sign Rank Test. This research received ethical approval from the Health Research Ethics Committee of STIKes Patria Husada Blitar in October 2023 with number 06/PHB/KEPK/176/10.23.

**RESULT**

**Table 1.** Characteristics of Respondents in Inpatient Room at Budi Rahayu Catholic Hospital, November 2023

No	Characteristics	(f)	(%)
1	<b>Ages</b>		
	60-70	11	55
	71-80	8	45
	>80	1	5
	Total	20	100
2	<b>Gender</b>		
	Male	11	55
	Female	9	45
	Total	20	100

Based on [Table 1](#), the distribution of respondents based on age is mostly aged 60-70, namely 55% or 11 respondents. Meanwhile, based

on gender, the majority were men, namely 55% or 11 respondents.

**Table 2.** Score of respondents' sleep quality before and after giving foot massage in Inpatient Room at Budi Rahayu Catholic Hospital, November 2023

No	Sleep Quality	Pre-test		Post-test	
		(f)	(%)	(f)	(%)
	Good	0	0	17	85
	Bad	20	100	3	15
	Total	20	100	20	100

Based on [Table 2](#) above, the results of scoring sleep quality before the foot massage procedure showed that 100%, or 20 respondents, experienced

poor sleep quality. Meanwhile, after the foot massage, it was found that 85%, or 17 respondents, had good sleep quality.

**Table 3.** Findings from a comparison of respondents' sleep quality before and after receiving foot massage

Variabel	Minimum	Maximum	Mean	SD	P Value
Before Foot Massage	7.00	11.00	8.4000	1.35336	.000
After Foot Massage	3.00	7.00	4.8500	.87509	

The test results using the Wilcoxon Signed Rank Test showed that the average sleep quality score before the foot massage was 8.4000 with a standard deviation of 1.35336, and the score after the foot massage was 4.8500 with a standard deviation of .87509, while the p-value was 0.000. we can therefore conclude that there is a substantial difference between the older patients' sleep quality score before and after foot massage

## DISCUSSION

The average sleep quality score before the foot massage was carried out was 8.4. According to the frequency distribution statistics, most responders were between the ages of 60 and 70. Decreased productivity in the elderly occurs due to physiological decline, which may result in a decline in the quality of sleep that older people get. ([Sumedi et al., 2019](#)) The study's findings indicated that 11 responders, or the majority, were men. Poor sleep quality in men may be caused by changes in testosterone hormone levels. The aging process affects the production of the hormone testosterone at night, when elderly men produce less testosterone. With a decrease in the amount of low testosterone levels, they tend to experience decreased sleep efficiency, waking up more frequently at night, and reduced time of slow-wave sleep ([Wittert, 2014](#)). According to other studies, women are more likely than men to experience poor sleep quality. Their sleep length was shorter, their sleep latency was longer, and their efficiency was worse, with more frequent sleep disturbance and sleep medication use, worse daytime dysfunction, lower self-rated sleep quality, and a higher overall PSQI score than men. The role of gender in influencing sleep quality in the elderly may be due to differences in muscle mass and bone mass in men and women. Women have lower bone mass and muscle mass than men ([Kohanmoo et al., 2024](#)).

Based on the research results, most respondents were in the 60-70 age range. Numerous pathological issues that impact sleep are often linked to aging. Pain syndromes, arthritis, digestive disorders, kidney and urologic disorders, and cancer are among the primary conditions faced by older adults. These conditions can cause sleep disturbances through specific symptoms or due to consequences or anxieties associated with them.

A p-value of 0.000 indicates that the sleep quality scores of the elderly differed before and after receiving a foot massage. How a person prepares for sleep at night, including the depth of their sleep, their ability to stay asleep, and how easily they can fall asleep without medical assistance, determines the quality of their sleep. Quality sleep can provide a sense of calm in the morning, increased energy, and fewer complaints of sleep disturbances.

Foot massage significantly improves the quality of sleep for individuals recovering from surgery. people recovering from surgery, ([Agung et al., 2021](#)).

Massage therapy (MT), which involves applying mechanical stress to the tissue, includes foot massage. MT is a treatment that can stimulate the movement of multiple muscle components. Massage can help us sleep better and heal more quickly by promoting muscle relaxation, which lowers stress, anxiety, and discomfort. Foot Massage represents one of the most common methods of complementary therapy ([Afianti & Mardhiyah, 2017](#)). Additionally foot massage helps post-operative patients at Dr. H Abdul Moeloek Hospital in Lampung Indonesia, sleep better ([Agung et al., 2021](#)). The quality of sleep for older women with RLS was improved by foot massage. It is advised that nurses and caregivers of the elderly understand and implement these simple, nearly cost-free interventions for their patients. ([Abbasi Fakhravari et al., 2018](#)). It's also a simple thing, non-

invasive, affordable, and a low-cost nursing intervention ([Sajadi et al., 2020](#)). Foot massage or foot reflexology is an effective nursing intervention for reducing fatigue and improving sleep quality, not only for the elderly but also for children ([Mohamed et al., 2023](#)). Other research shows that foot massage combined with essential oil is an effective treatment for the elderly to improve sleep quality ([Puspawati et al., 2021](#)). This intervention has benefits compared to nonactive control practices in terms of ameliorating the burden of depression, anxiety, and sleep disturbance ([Wang et al., 2020](#)). This intervention is not only effective for the elderly but also for individuals with leukemia, reducing nausea and vomiting in patients with lung cancer receiving chemotherapy. It can support the effectiveness of complementary modalities ([Parizad et al., 2024](#); [Pekmezci & Hintistan, 2022](#)).

In addition to improving blood and lymph circulation, foot massage increases blood flow in muscles, which lowers discomfort and inflammation. In addition to improving sleep, it can have a profoundly calming impact and lessen anxiety, pain, and physical discomfort. The neurotransmitters serotonin and dopamine are increased when the foot is massaged. This causes the hypothalamus to create more corticotropin-releasing factors (CRF), which in turn causes the pituitary gland to make more of them. Because massages can have a calming, relaxing impact, stimulate the neurological system, and promote muscle activity, it can also speed up the circulatory system. For example, massaging the feet can relax the muscles, making the patients relax ([Afianti & Mardhiyah, 2017](#)). Another study explains that massage can increase sleep quality by relaxing muscles and reducing stress and anxiety ([Ünal Aslan & Altın, 2022](#)). Additionally, individuals receiving hemodialysis may find that foot reflexology massage improves their quality of life, lowers anxiety, and improves sleep. ([Göktuna & Arslan, 2024](#)).

Massage is a non-pharmacological therapeutic approach that involves massaging or exerting pressure to the body tissues. A foot massage can lower cortisol levels and activate

pressure receptors beneath the skin. It also can stimulate the adrenal medulla to increase the secretion of endorphins that activate the parasympathetic so that vasodilatation occurs in vessels and facilitates blood flow. RAS can increase serotonin release and aid in promoting sleep, which will enhance the quality of sleep. ([Widyaningrum et al., 2023](#)). Similarly, foot reflexology massage can also improve sleep quality in lymphoma patients. It can also release endorphins, enhance the feeling of well-being and relaxation, and improve blood flow to stimulate sleep ([Rambod et al., 2019](#)).

Physiologically, in the foot area, there are many nerves, especially in the skin, namely the flexus venosus. From this series of nerves, stimulation is transmitted to the posterior horn, then continues to the spinal cord, from here it is transmitted to laminae I, II, III of the dorsal roots, then to the ventro basal thalamus, and into the trunk. The brain, precisely in the lower raphe area of the pons and medulla, is where the soporific effect (wanting to sleep) occurs. Foot massage provides the benefit of reducing anxiety, stress, and pain felt by the patient. even if the message is given for a short time and only on the feet, it can provide the benefit of being calmer, reducing stress, and improving sleep ([Sugiyono, 2013](#)). Foot massage has an impact on the elderly's quality of sleep. The level of insomnia in the elderly before foot massage therapy with lavender essential oil was the highest on the mild scale. After the intervention, there was a significant change from moderate to mild and from mild to no complaints, as well as a marked decrease in the level of insomnia in the intervention group ([Pramesti et al., 2019](#)). Elderly patients may experience a profoundly calming impact from foot massage. It can produce a stimulus that reaches the brain more quickly, increasing the secretion of serotonin and dopamine. Then, massage stimulates the release of endorphins, thus making the body feel relaxed because sympathetic nerve activity decreases and can improve sleep quality. Another research said that foot massage is an effective medication, safe and without side effects that relaxing feel will trigger the release of endorphins ([Pramesti et al., 2019](#)). So this method can be used

as a non-pharmacological treatment in elderly health programs to improve sleep quality (Valizadeh et al., 2015).

## CONCLUSION

Based on the research results, the average score for sleep quality of elderly patients before foot massage was 8.4. Meanwhile, the average score for sleep quality of elderly patients before foot massage was 4.85. Foot massage affected the sleep quality of elderly patients in the inpatient room at Budi Rahayu Catholic Hospital Blitar, with a p-value of 0.000.

## SUGGESTION

Nurses can use foot massage to improve the sleep quality of elderly patients in the inpatient room. Hospitals are advised to create an SOP for foot massage to guide nurses in this action.

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## CONFLICT OF INTEREST

The author declares no conflicts of interest in this research and publication.

## AUTHOR CONTRIBUTIONS

TW contributed significantly to the data collection, analysis, interpretation, conceptualization, and design of the results. YKS and RR DRAP were responsible for developing or examining the text for essential intellectual elements and the final checks and submission.

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